



All About the NESDI Program

**The Navy's Environmental
Shoreside 6.4 Research,
Development, Test
& Evaluation Program**

The NESDI Program

What's It All About

The Navy Environmental Sustainability Development to Integration (NESDI) program is the Navy's environmental shoreside 6.4 Research, Development, Test and Evaluation (RDT&E) program. The NESDI technology demonstration and validation program is sponsored by the Chief of Naval Operations Environmental Readiness Division (N45) and managed by the Naval Facilities Engineering Command (NAVFAC). The program is the Navy's complement to the Department of Defense's (DoD) Environmental Security Technology Certification Program (ESTCP) which conducts demonstration and validation of technologies important to the tri-Services, U.S. Environmental Protection Agency and Department of Energy.



Our Vision

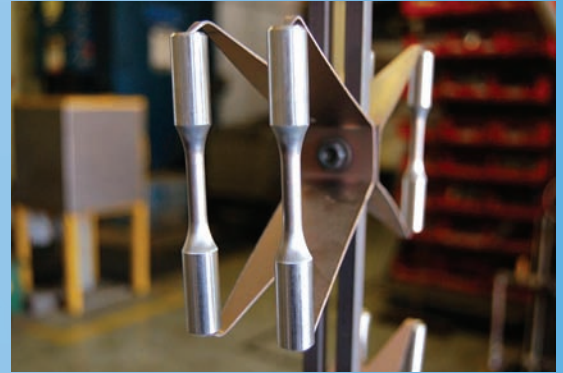
The vision of the NESDI program is to be the Navy's premier applied technology development and demonstration program that integrates innovative solutions and knowledge to shape investments in global, emerging environmental challenges that sustain fleet readiness.

Our Mission

The mission of the NESDI program is to provide solutions by demonstrating, validating and integrating innovative technologies, processes, materials and filling knowledge gaps to minimize operational environmental risks, constraints and costs while supporting Fleet readiness.

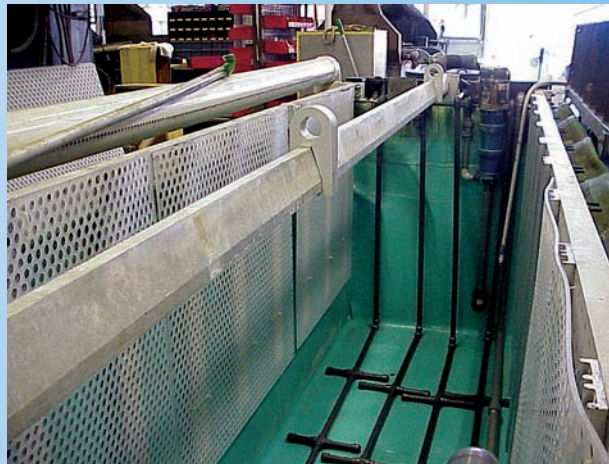
Is This Program for Me?

The NESDI program provides resources to those Navy activities that are actively involved in the testing and evaluation of emerging technologies and materials and enhancements to existing industrial processes. In an effort to retain in-house capabilities and subject matter expertise, the role of NESDI program Principal Investigators has typically been limited to personnel at naval facilities. Specialized or unique skills are often obtained by reaching out to the academic and contractor communities on a project-by-project basis.



Optimizing the Anodizing Process.

This project successfully demonstrated and integrated technologies to optimize the application of anodized coatings to aircraft components and parts at Fleet Readiness Centers in Jacksonville, FL and Cherry Point, NC.



Our Sponsor

The NESDI program supports N45's focus on addressing the environmental technology requirements of Navy shore and range operations and improving management processes for achieving and maintaining the environmental readiness of the Fleet.

N45 provides resources and oversight regarding research and development (R&D) investments and develops and maintains overarching environmental readiness capability requirements. N45 also develops policy and guidance to support Navy compliance with environmental laws and regulations and provides oversight of Navy environmental compliance and restoration programs.



The NESDI Program

Customers & Investigators

Historically, program resources have been distributed to employees of NAVFAC, the Naval Air Systems Command (NAVAIR), the Naval Sea Systems Command (NAVSEA) and the Space and Naval Warfare Systems Command (SPAWAR). NESDI Principal Investigators often collaborate with personnel from other Navy research organizations.

Our Primary Customers

The NESDI program concentrates its efforts on the following customer base:

1. Fleet Maintenance Personnel.

Enlisted, civilian and contractor personnel who maintain Navy assets (aircraft, ships, etc.) for insights into the outstanding needs of the maintenance community and help to integrate environmentally-friendly technologies, materials and industrial process changes into the daily operation of Navy maintenance facilities.

2. Testing & Training Range Personnel.

The managers and support staff of the Navy's testing and training ranges who have the need to operate those ranges in an environmentally-compliant and efficient manner.

3. Members of Environmental Working Groups & Media Teams.

Members of the various Navy environmental working groups and media field teams who identify outstanding technology demonstration/validation needs.



Shipboard Mobile Surface Cleaning Technology.

This project is validating a mobile surface cleaning technology for critical cleaning of shipboard non-skid and shoreside surfaces to remove contaminants, mitigate pollution from weather deck and stormwater runoff and reduce associated manpower and waste management burden.



4. Regional, Field Activity & Installation Environmental Program Managers.

Personnel who operate and oversee the execution of environmental programs at Navy Regions, field activities and installations including the Fleet Readiness Centers and shipyards who identify outstanding needs, support on-site technology demonstrations and are the primary users of the program products and services.

5. N45 Leadership & NAVFAC Headquarters.

The managers and staff at N45 and NAVFAC Headquarters who are among the first to recognize the need for the demonstration and validation associated with emerging requirements identified in new Executive Orders, regulations, directives and instructions including greenhouse gas emissions, climate change and the interface between energy and environmental management-topics that may impact the future operations of the Navy.

6. Acquisition Program Managers.

Acquisition program managers and their Environmental, Safety and Occupational Health Coordinators who identify the need for technology demonstration and validation and guide the integration of solutions across multiple weapon system platforms.



The NESDI Program

What We Do

The NESDI program is focused on three primary objectives:

1. Collect, Validate & Rank Environmental RDT&E Needs.

The program expands awareness of opportunities within the Navy shoreside community to encourage and facilitate the submittal of well-defined environmental needs and requirements.

2. Resolve High Priority Needs.

The program seeks to ensure that program investments and the resulting RDT&E projects maintain a direct and consistent link to the defined needs.

3. Integrate Solutions & Validate Benefits.

The program also works to maximize the number of program-derived solutions that are successfully integrated into the Fleet and future weapons system acquisitions and verify that the solutions provide the anticipated benefits.



Where We Invest

The NESDI program makes its primary investments in the following areas and Environmental Enabling Capabilities (EEC):

1. Range Sustainment (EEC-2).

Innovations that address environmental impacts and restrictions at Navy ranges to ensure that naval training ranges and munitions testing/ manufacturing ranges are fully available and efficiently utilized. Example projects in this area are:

- A study to assess the potential effects of lasers on marine life, and
- Development of a comprehensive data set on toxicity of munitions constituents to regulatory acceptable marine species and the definition of their potential for bioaccumulation, cellular level impacts and trophic transfer.

2. Ship-to-shore Interface (EEC-4).

Develop innovative techniques to manage ship hazardous material/waste offload to shore facilities. An example of one project in this area is an ongoing effort to select, procure and integrate proven technologies that collect and concentrate solids and fine particles from dry dock floors, pump wells, cross connection channels, trenches, rail tracks and adjacent areas to the dry dock. Another project in the ship-to-shore interface area is an effort to demonstrate and integrate a low-cost, modular device that combines semi-autonomous motion with portable containment to maximize operator productivity while capturing the paint overspray before it can contaminate the dry dock.



3. Weapon System Sustainment (EEC-3).

Focus on the organizational- and intermediate-level Fleet maintainer to reduce the cost of compliance and increasing Fleet readiness. Example projects include:

- a. Validating the use of alternative technologies (including corn hybrid polymer) for the effective repair of aircraft radomes, and
- b. Demonstrating and validating the use of High Velocity Oxygen Fuel coatings as a replacement for hard chromium plating on helicopter dynamic components.

4. Air and Port Operations (EEC-4).

Address issues pertaining to air and port operations that ensure Fleet readiness. Example projects in this area include:

- a. Validating a cathodic protection system to achieve effective corrosion prevention while reducing environmental impacts of caisson and floating dry dock ballast discharges, and
- b. Assessing the feasibility of coatings and other material advancements for permanent oil booms that mitigate biofouling accumulation and enhance compliance through increased reliability, extended life and a reduced maintenance burden.

5. Regulatory and Base Operations (EEC-5).

Cost-effective methods for identifying, analyzing and managing environmental constraints related to current and projected regulatory impacts. Example projects include:

- a. Establishing guidelines and limitations for the use of biodiesel with ground tactical vehicles and equipment, and
- b. Quantifying Navy contaminant loads by demonstrating and validating contaminant source tracking technologies and developing a technical framework that enables water program managers to attribute existing contamination loads to support their compliance programs.

Where We Don't Invest

The NESDI program's philosophy is not to duplicate investments that are more appropriately funded by other Navy programs, including:

- Marine mammal research,
- Ship afloat programs,
- Radiological control and health programs,
- Cleanup of Environmental Restoration sites (except as part of a leveraged investment to demonstrate a new technology or method-for example, the analysis and management of contaminated sediments), and
- The Navy's Energy Program (except where there is a very strong environmental component to a particular energy management project).

The NESDI Program

How You Can Participate

The NESDI program relies on all Navy personnel to help identify environmental concerns and support the implementation of resultant solutions. We ask that, wherever possible, you find a way to use NESDI products.

Organizations Participating in the NESDI Program

Over the years, a range of organizations from across the Navy and elsewhere have supported the NESDI program in one way or another. Personnel from the following organizations have supported the program by:

- Attending an IPR,
- Submitting or ranking a need,
- Submitting or ranking a pre- or full proposal,
- Contributing to the progress of the project,
- Providing ad hoc advice and guidance, and/or
- Logging into the program's web site.

1. Applied Research Laboratory
Penn State
2. Chief of Naval Operations
Environmental Readiness Division
3. Commander, Atlantic Fleet
4. Commander,
Navy Installation Command
5. Commander,
Navy Region Mid-Atlantic
6. Commander,
Navy Region Southwest
7. Commander, Pacific Fleet
8. Engineering Field Activity
Northeast
9. Engineering Field Division South
10. Environmental Security Technology
Certification Program
11. Explosive Ordnance Disposal
Mobile Unit Three
12. Fleet Assistance Support and
Technology Transfer Team
13. Fleet Forces Command
14. Fleet Forces Command,
Range Complex Support Team
15. Fleet Industrial Supply Center
Puget Sound
16. Fleet Readiness Center East
17. Fleet Readiness Center South
18. Fleet Readiness Center Southeast
19. Fleet Readiness Center Southwest
20. Naval Air Engineering
Station Lakehurst, NJ





21. Naval Air Station
Fallon, NV
22. Naval Air Station
Jacksonville, FL
23. Naval Air Station
Patuxent River, MD
24. Naval Air Station
Whidbey Island, WA
25. Naval Air Systems Command
26. Naval Air Systems Command,
Design Interface and
Maintenance Planning
27. Naval Air Warfare Center-
Aircraft Division
Lakehurst, NJ
28. Naval Air Warfare Center-
Aircraft Division
Patuxent River, MD
29. Naval Air Warfare Center-
Weapons Division
China Lake, CA
30. Naval Base Kitsap
Bangor, WA
31. Naval Facilities
Engineering Command
32. Naval Facilities
Engineering Command Atlantic
33. Naval Facilities
Engineering Command
Engineering Field Division
Southwest
34. Naval Facilities
Engineering Command
Environmental Compliance
35. Naval Facilities
Engineering Command
Hawaii
36. Naval Facilities
Engineering Command Headquarters
37. Naval Facilities
Engineering Command Mid-Atlantic
38. Naval Facilities
Engineering Command Northwest
39. Naval Facilities
Engineering Command Pacific
40. Naval Facilities
Engineering Command Southeast
41. Naval Facilities
Engineering Command Southwest
42. Naval Facilities
Engineering Command Washington
43. Naval Facilities
Engineering Service Center
44. Naval Facilities Marianas
45. Naval Sea Systems Command
46. Naval Sea Systems Command
Contaminated Water Program
47. Naval Sea Systems Command
Headquarters
48. Naval Sea Systems Command
Headquarters, Asset Management
49. Naval Sea Systems Command,
Laboratory Quality Accreditation
Office
50. Naval Sea Systems Command,
Salvage and Diving Operations
51. Naval Station
Everett, WA
52. Naval Support Activity
Crane, IN
53. Naval Support Activity
Panama City, FL
54. Naval Surface Warfare Center
Carderock, MD
55. Naval Surface Warfare Center
Dahlgren, VA
56. Naval Surface Warfare Center
Philadelphia, PA
57. Naval Surface Warfare Center
Washington, DC
58. Naval Undersea Warfare Center
Newport, RI
59. Navy Region Southwest
60. Norfolk Naval Shipyard
61. Office of the Secretary of Defense
62. Pearl Harbor Naval Shipyard
63. Portsmouth Naval Shipyard
64. Public Works Department
Kingsville, TX
65. Puget Sound Naval Shipyard
& Industrial Maintenance Facility
66. Ship Repair Facilities and Japan
Regional Maintenance Center
67. Southeast Regional
Maintenance Center
68. Space and Naval Warfare
Systems Command
69. Space and Naval Warfare
Systems Command, Systems
Center - Pacific
70. Strategic Environmental Research
and Development Program
71. Submarine Base Kings Bay, GA
72. Submarine Base San Diego, CA
(Point Loma)
73. University of California
at Santa Barbara
74. Virginia Class Program Office

Participate in our process— you can play a vital role by:

- Submitting and validating environmental needs,
- Reviewing technologies already in development,
- Supporting transition efforts in your organization
or at your installation,
- Acting as a Principal Investigator on one of our projects,
- Providing demonstration sites for our various projects, and
- Staying up-to-date by regularly visiting our web site.



Successful NESDI Projects

Although the scope and focus of NESDI-sponsored projects are broad and diverse, most projects range in duration from two to three years with a total project funding level of \$200,000 to \$300,000.

The following is a sampling of some of the technologies that were successfully demonstrated and studies that were successfully conducted via the NESDI program over the past several years.



Comprehensive Environmental Compliance Approach for Cathodic Protection in Caissons & Floating Dry Docks.

This project validated a cathodic protection system to achieve effective corrosion prevention while reducing environmental impacts of caisson and floating dry dock ballast discharges.

Acid Waste Treatment Technology.

This project resulted in the integration of a pier side system for the recycling, reuse and management of acid and heavy metal wastewater generated from shipboard seawater heat exchanger pipe flushing operations that meet local sanitary sewer discharge limits.





No. Project

Description

1. Acid Waste Treatment Technology

This project resulted in the integration of a pier side system for the recycling, reuse and management of acid and heavy metal wastewater generated from shipboard seawater heat exchanger pipe flushing operations that meet local sanitary sewer discharge limits.

2. Comprehensive Environmental Compliance Approach for Cathodic Protection in Caissons & Floating Dry Docks

This project validated a cathodic protection system to achieve effective corrosion prevention while reducing environmental impacts of caisson and floating dry dock ballast discharges.

3. Compwater Fuel Ballast Water Treatment

This project identified, evaluated, selected and demonstrated Navy-wide Best Management Practices for the in-port collection and treatment of compensated fuel ballast water.

4. Environmental Effects of Lasers on Biota in the Marine Environment

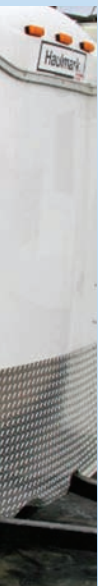
This study assessed the extent and diversity of the laser-based systems being used in an underwater environment and their potential effect on the surrounding biological communities and marine life.

5. Global Climate Change Initiation Decision Report

This report provides an assessment of climate change impacts on Navy installations and provides recommendations to support mission readiness.

6. Low Range Differential Pressure Leak Detection System for Bulk Fuel Storage Tanks

This project led to the development of a leak detection capability for 20 large bulk tanks (12 million gallon capacity) at the Fleet and Industrial Supply Center's Red Hill facility and for 50,000-gallon underground storage tanks at Barking Sands, HI.





Successful NESDI Projects

No.	Project	Description
7.	Operational Range Clearance	This project will provide Navy range managers with a strategy to minimize the costs associated with the management (clearance) of discarded material including unexploded ordnance, partial or low-order detonations, targets, casing fragments and tires.
8.	Prohibited and Controlled Chemical List & Target Chemical List	This project provided the Navy with standard chemical inventories for both weapon system program and facility operations managers to use to improve their hazardous material management and minimization efforts.
9.	Real-time Drinking Water Contamination Detection System	This project is validating a real-time contamination detection system that continuously monitors drinking water supplies to ensure that high quality drinking water is being delivered and provides water security surveillance to guard against the threats of terrorist attacks on water systems.
10.	Shipboard Mobile Surface Cleaning Technology	This project is validating a mobile surface cleaning technology for critical cleaning of shipboard non-skid and shoreside surfaces to remove contaminants, mitigate pollution from weather deck and stormwater runoff and reduce associated manpower and waste management burden while in port.





No.	Project	Description
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11.	Toxicity/ Bioaccumulation of Munitions Constituents in the Marine Environment	This project resulted in the development of a comprehensive data set on the toxicity of munitions constituents to regulatory acceptable marine species and the definition of potential bioaccumulation, cellular level impacts and trophic transfer.
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12.	Biodetoxification of Oily Sludges	This project demonstrated and validated the use of microbes in a Sequencing Batch Reactor system to effectively treat concentrated amounts of oily sludge from petroleum tanks. An Oily Waste Treatment Facility is now in full-scale operation at Naval Shipyard Pearl Harbor with a 10,000-gallon reactor.
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13.	Corrosion-Inhibited Mildew Remover	The conventional means of mildew removal entails the use of alcohol and solvents that are ineffective. Sailors and Marines are therefore exposed to harmful mildew, and the process also generates hazardous waste. This project validated the use of a new material to remove mildew from aircraft floorboards and confined areas that is environmentally benign, effective and inhibits new mildew growth and corrosion.
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14.	Disinfection Byproducts Users Guide	This project resulted in the publication of The Potable Water Quality Management Guidance Document which provides Navy drinking water program managers with the direction and information for meeting compliance goals contained in the new disinfection byproducts rules.
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15.	Effective Alternative Technologies for Radome Repair	This project validated the use of epoxy resin as a viable alternative to polyester for radome repair and corn hybrid polymer media for radome paint stripping.
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16.	F-404 Engine Drive Shaft Cleaning	This project demonstrated the use of Type V Plastic Media Blasting to remove coking from F-404 engine drive shafts, air ducts and dampers to replace a process that involved soaking the component parts in solvent and then scraping off the build-up.
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No Foam System For Aircraft Hangar Fire Suppression System & Fire Fighting Pumper Trucks Foam Discharge Checks.

These projects demonstrated and validated the effectiveness of the NoFoam System technology to minimize or eliminate the Aqueous Film Forming Foam-generated wastewater from aircraft hangar fire suppression foam system annual discharge checks and during the annual testing of fire fighting pumper trucks.



Successful NESDI Projects



No.	Project	Description
17.	No Foam™ System For Aircraft Hangar Fire Suppression System & Fire Fighting Pumper Trucks Foam Discharge Checks	These projects demonstrated and validated the effectiveness of the NoFoam™ System technology to minimize or eliminate the Aqueous Film Forming Foam-generated wastewater from aircraft hangar fire suppression foam system annual discharge checks and during the annual testing of fire fighting pumper trucks.
18.	Noise Attenuation Device	This project developed a low cost approach for reducing the noise from DoD's high performance jet engines during stationary testing.
19.	Optimizing the Anodizing Process	This project successfully demonstrated and integrated technologies to optimize the application of anodized coatings to aircraft components and parts.
20.	Portable Aircraft Maintenance Facility	This project resulted in an integrated system that allows for the environmentally friendly stripping and painting rotary wing aircraft at Intermediate Maintenance Program deployed sites.
21.	Advanced Sealant Technologies	This project demonstrated, validated and implemented alternative conductive gaskets and non-conductive seals/sealants for antennas, static wicks, floorboards and windscreens to measure survivability in the Navy's corrosive and high fluid environments.
22.	Sediment Transport User's Guide	This project resulted in the publication and web-posting of The Sediment Transport User's Guide that provides Remedial Project Managers with practical guidance for evaluating the transport of sediments at contaminated sites to achieve successful, cost-effective remedial decisions.
23.	Using the Web to Display Bird Sightings in Aircraft Pathways	This project is achieving cost reductions and collision (liability) avoidances by using the web to display bird sightings in aircraft pathways.
24.	Web-based Model Server	This project increased the accessibility to joint/interagency environmental models through a common user interface with web-based model simulation architecture.



Our Web Site

For up-to-date information about NESDI-sponsored R&D projects and to participate in the ongoing execution of the program, visit the NESDI program web site at www.nesdi.navy.mil.

You can also contact our webmaster, Eric Rasmussen, at 732-323-7481 and eric.rasmussen@navy.mil.

Effective Alternative Technologies for Radome Repair.
This project validated the use of epoxy resin as a viable alternative to polyester for radome repair and corn hybrid polymer media for radome paint stripping.



The NESDI Program

Who to Contact

For more information about the operation of the NESDI program, contact Leslie Karr, the NESDI program manager, at 805-982-1618 (DSN: 551-1618) and leslie.karr@navy.mil.

Members of the NESDI program's TDWG can be contacted at the following phone numbers and email addresses:

No.	Who	Command	Phone	Email
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